

Abstract Submitted
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Component morphology, size, and compositional impact on pharmaceutical powder blend flowability DAVID GOLDFARB, HIROTAKA NAKAGAWA, STEPHEN CONWAY, Merck Research Laboratories — Through analysis of particle morphology, particle size, and compositional influences, we present experimental case studies revealing unexpected transitions in flowability and cohesion of pharmaceutical powder blends. We explore interactions between the needle-like API (Active Pharmaceutical Ingredient) and the more spherical remaining components (excipients) in the blend to explain these transitions, and optimal concentrations are identified. A range of particle sizes, aspect ratios (for API), and compositions were examined. Surprisingly, under certain conditions, a blend with a low API concentration exhibits less cohesive flowability properties than a placebo blend containing no API. Effective volume and coordination number models are tested by investigation of particle geometry, particle contact, and Van der Waals force factors. These results should translate both to the improved understanding of mixed component morphology systems and to a novel approach towards pharmaceutical product formulation optimization.

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